CLAIMS:

1. A dispenser for dispensing flexible sheet material, comprising:

a support for rotatably supporting a roll of sheet material;

a feed mechanism for advancing the sheet material out of the dispenser;

a drive member for driving the feed mechanism, said drive member being movably mounted for movement into and out of engagement with said feed mechanism; and

a hold mechanism for holding said drive member in engagement with said feed mechanism, said hold mechanism being manually releasable to permit said drive member to be moved out of engagement with said feed mechanism.

2. The dispenser of claim 1, wherein said drive member is rotatably movable into and out of engagement with said feed mechanism.

3. The dispenser of claim 1, wherein said feed mechanism includes a feed roller and a spur gear connected to said feed roller, and said drive member comprises a worm gear for engaging said spur gear.

4. The dispenser of claim 1, wherein absent a jam said feed mechanism is freely rotatable when said drive member is disengaged from said feed mechanism.

5. The dispenser of claim 1, wherein said hold mechanism is manually releasable by finger operation.

6. The dispenser of claim 5, wherein said hold mechanism comprises:

a retention clip attached to the dispenser; and

a spring arm for selectively snapping into engagement with said retention clip.

7. The dispenser of claim 5, wherein said drive member forms part of a drive mechanism including a motor for driving said drive member, said drive mechanism being movable as a unit into and out of engagement with said feed mechanism.

8. The dispenser of claim 7, wherein said drive mechanism is rotatable as a unit into and out of engagement with said feed mechanism.

9. The dispenser of claim 7, further comprising a carrier retaining said drive mechanism for movement as a unit into and out of engagement with said feed mechanism.

10. The dispenser of claim 9, wherein said carrier rotatably mounts said drive mechanism for rotation into and out of engagement with said feed mechanism.

11. The dispenser of claim 7, said motor being fixedly attached to said drive member by a drive shaft.

12. The dispenser of claim 11, wherein said drive member comprises a worm gear.

13. The dispenser of claim 10, said carrier comprising:

a motor chamber for retaining said motor;

a drive member chamber disposed adjacent to said motor chamber for retaining said drive member; and

a wall structure separating said motor chamber from said drive member chamber.

14. The dispenser of claim 13, wherein said carrier defines a port allowing ingress and egress of at least a portion of said feed mechanism, for engagement of said feed mechanism with said drive member.

15. The dispenser of claim 14, wherein said drive member comprises a worm gear, said feed mechanism includes a feed roller and a spur gear connected to said feed roller, and said spur gear at least partially enters said drive member chamber to engage said worm gear.

16. The dispenser of claim 13, wherein said motor includes a drive shaft that extends through said wall structure and is fixedly attached to the drive member.

17. The dispenser of claim 16, further comprising a retaining structure opposed to said wall structure for rotatably supporting said drive shaft, said drive member being retained between said retaining structure and said wall structure.

18. A drive mechanism assembly for selectively engaging with and driving a feed mechanism of a flexible sheet material dispenser, said drive mechanism assembly comprising:

a motor having a drive shaft;

a drive member attached to said drive shaft, for drivingly engaging a said feed mechanism in an engagement position; and

a carrier retaining therein said motor and drive member, said carrier including a rotatable mounting member for rotatably mounting said motor and drive member to a dispenser chassis for rotation as a unit into and out of said engagement position.

19. The drive mechanism of claim 18, wherein an axis of rotation of said rotatable mounting member extends substantially orthogonally with respect to said drive shaft.

20. The drive mechanism of claim 18, wherein said drive member comprises a worm gear.

21. The drive mechanism of claim 18, said carrier comprising:

a motor chamber for retaining said motor;

a drive member chamber disposed adjacent to said motor chamber for retaining said drive member; and

a wall structure separating said motor chamber from said drive member chamber.

22. The drive mechanism of claim 21, wherein said carrier defines a port allowing ingress and egress of at least a portion of said feed mechanism, for engagement of said feed mechanism with said drive member.

23. The drive mechanism of claim 22, wherein said drive member comprises a worm gear and said feed mechanism includes a feed roller and a spur gear connected to said feed roller, and said spur gear enters said drive chamber to engage said worm gear in said engagement position.

24. The drive mechanism of claim 21, wherein said motor includes a drive shaft that extends through said wall structure and is fixedly attached to the drive member.

25. The drive mechanism of claim 21, further comprising a retaining structure opposed to said wall structure for rotatably supporting said drive shaft, said drive member being retained between said retaining structure and said wall structure.

26. The drive mechanism of claim 24, wherein further comprising a clip disposed on the end of said drive shaft for preventing translation of said drive shaft out of said retainer.

27. The drive mechanism of claim 18, wherein said carrier includes a spring arm for snapping into and out of engagement with a corresponding retention clip attached to a said

flexible sheet material dispenser, to releasably hold said motor and drive member in said engagement position.

28. A method of removing a jam from a dispenser for dispensing flexible sheet material, the method comprising:

detecting a sheet material jam;

disengaging a drive mechanism of said dispenser from a feed mechanism of said dispenser;

clearing said jam from the path of the feed mechanism by rotating said feed mechanism while it is disengaged from said drive mechanism; and

reengaging said drive mechanism with said feed mechanism.

29. The method of claim 28, wherein said step of disengaging includes moving a motor and a corresponding drive shaft of said drive mechanism together as a unit to drivingly disengage said drive shaft from said feed mechanism.

30. The method of claim 29, wherein the motor and drive shaft of said drive mechanism are rotated as a unit to drivingly disengage said drive shaft from said feed mechanism.

31. The method of claim 30, wherein the step of disengaging includes manually unclipping a spring arm movable with said motor and drive shaft from a retention clip connected to a chassis of the dispenser.

32. A dispenser for dispensing flexible sheet material, comprising:

a feed mechanism;

a drive mechanism for selectively driving said feed mechanism;

a control device for controlling said drive mechanism;

a battery container for removably holding at least one battery for powering at least one of said drive mechanism and said control device; and

a power line input port to which a power line may be connected to supply power to at least one of said drive mechanism and said control device in lieu of battery power, said power line input port being arranged in relation to said battery container such that (1) when said battery

container is loaded with said at least one battery to supply power to at least one of said drive mechanism and said control device, said line input port is prevented from being connected to a said power line; and (2) when said battery container is unloaded said power line input port is readily accessible for connection of a said power line.

33. The dispenser of claim 32, wherein said power line input port is accessible only from within said battery container, such that when said battery container is loaded said at least one battery blocks access to said power line input port.

34. The dispenser of claim 32, wherein said power line input port is accessible only from within said battery container, such that when a said power line is connected to said power line input port said power line necessarily extends within said battery container and interferes with the loading of at least one of said batteries into said battery container.

35. A dispenser for dispensing flexible sheet material, comprising:

a support for rotatably supporting a roll of sheet material;

a feed mechanism for advancing the sheet material from said roll;

a motor for driving the feed mechanism;

a structure defining a discharge chute of the dispenser downstream of said feed mechanism;

a sensor for detecting the presence and absence of sheet material in said discharge chute and outputting respective first signals indicative thereof;

a proximity sensing system including an RF antenna, for detecting the presence of a user's hand in close proximity to the dispenser and outputting a second signal indicative thereof; and

a control device for receiving said respective first signals and second signal and controlling said motor to selectively drive said feed mechanism in response thereto;

wherein, said sensor is mounted on a first printed circuit board mounted on said structure adjacent to said discharge slot, and said antenna is mounted on a second printed circuit board mounted on said structure and positioned in overlying relation to the first printed circuit board.

36. The dispenser of claim 35, wherein said first and second printed circuit boards are each removably clipped into respective seats provided as part of said structure.

37. The dispenser of claim 35, wherein an electrical shield is positioned between said antenna and said sensor.

38. The dispenser according to claim 37, wherein said shield comprises a metalized layer formed on said second printed circuit board.

39. The dispenser according to claim 35, wherein said sensor comprises an optical emitter/receiver pair.

40. The dispenser according to claim 35, wherein said first printed circuit board is elongated and extends along a width of said discharge slot, and a pair of said sensors are mounted in spaced relation on said first printed circuit board.

41. A dispenser for dispensing flexible sheet material, comprising:

a support for rotatably supporting a roll of sheet material;

a feed mechanism for advancing the sheet material from said roll;

a motor for driving the feed mechanism;

a structure defining a discharge chute of the dispenser downstream of said feed mechanism;

a transfer mechanism for contacting a leading segment of sheet material extending from a roll and moving said sheet material into a feed nip of said feed mechanism;

a sensor for detecting the presence and absence of sheet material in said discharge chute and outputting respective signals indicative thereof; and

a control device for receiving said respective signals, and controlling said motor to selectively drive said feed mechanism in response thereto to dispense a predetermined length of the sheet material from the point at which a leading edge portion is detected by one of said plurality of sensors, said control device further determining, based upon said signals, a condition wherein a working roll of sheet material is either absent or depleted, and in response to said determination controlling said transfer mechanism to attempt a transfer of feed to a new roll of sheet material.

42. The dispenser according to claim 41, wherein said control device determines a depletion or absence of a working roll based upon said sensor detecting the absence of sheet material in said discharge chute for a predetermined interval of advancement of said feed mechanism by said motor.

43. The dispenser according to claim 42, wherein said predetermined interval of advancement is set by a sheet detection timer of said control device.

44. The dispenser according to claim 41, wherein said transfer mechanism comprises a motor, the operation of which is controlled by said control device.

45. The dispenser according to claim 44, wherein said motor drives a transfer bar of said transfer mechanism to move toward said feed nip of said feed mechanism, for contacting a leading segment of sheet material extending from a roll and moving said sheet material into said feed nip of said feed mechanism.

46. The dispenser according to claim 44, wherein said transfer mechanism comprises:

a transfer member biased toward said feed nip and into contact with said leading segment of sheet material; and

a transfer link movable between a first position wherein said transfer link retains said transfer bar away from said feed nip, against said bias, and a release position wherein said transfer link permits said transfer member to move toward said feed nip under said bias and into contact with said leading segment of sheet material;

wherein, said motor drives said transfer link from said first position to said release position, and said control device activates said motor to drive said transfer link from said first position to said release position.

47. A dispenser for dispensing flexible sheet material, comprising:

a support for rotatably supporting a roll of sheet material;

a feed mechanism for advancing the sheet material from said roll;

a motor for driving the feed mechanism;

a plurality of sensors spaced along a width of said sheet material for detecting respective leading edge portions of said sheet material and outputting respective signals indicative thereof; and

a control device for receiving said respective signals and controlling said motor to drive said feed mechanism to dispense a predetermined length of the sheet material from the point at which a leading edge portion is first detected by one of said plurality of sensors.

48. The dispenser of claim 47, further comprising a structure defining a discharge chute downstream of said feed mechanism, and wherein said plurality of sensors are mounted on said structure to detect the presence and absence of sheet material within said discharge chute.

49. The dispenser of claim 48, wherein said plurality of sensors comprise a plurality of optical sensors.

50. The dispenser according to claim 49, wherein said optical sensors are mounted in spaced relation on a printed circuit board extending along a width of said discharge chute.

51. The dispenser according to claim 50, wherein said printed circuit board is snap-fit within a slot providing a passageway through said structure to said discharge chute.

52. A dispenser for dispensing flexible sheet material, comprising:

a support for rotatably supporting a roll of sheet material;

a feed mechanism for advancing the sheet material from said roll;

a motor for driving the feed mechanism;

a sensor for detecting a leading edge portion of said sheet material and outputting a signal indicative thereof;

a measurement device for measuring a first interval of advancement of said feed mechanism terminating with a detection of a leading edge portion by said sensor; and

a control device for receiving signals from said sensor and said measurement device and for controlling said motor to drive said feed mechanism to dispense a predetermined length of the sheet material from a determined initialization point, said control device comprising:

a storage device for storing a nominal measure of said first interval of advancement;

a comparator for comparing a measurement of said measurement device with said nominal value; and

determination means for determining said initialization point for a given dispense cycle based upon an output of said comparator.

53. The dispenser according to claim 52, wherein for a current dispense cycle said determination means selects as said initialization point the point at which said sensor detects a said leading edge, if a difference between a measurement of said measurement device for the current dispense cycle and said nominal value does not exceed a predetermined amount, and selects as said initialization point a point corresponding to said nominal value if said difference exceeds said predetermined value.

54. The dispenser according to claim 53, wherein the nominal value stored in said storage device is calculated based upon measurements made by said measurement device.

55. The dispenser according to claim 54, wherein the nominal value is a moving average of measurements made by said measurement device for past dispense cycles.

56. The dispenser according to claim 52, wherein said measurement device comprises a shaft encoder that counts intervals of displacement of a feed roller of the feed mechanism.

57. A dispenser comprising:

a housing having a discharge opening;

a support within the housing for supporting a continuous strip of sheet material having a plurality of spaced tear lines defining leading and trailing edges of individual removable segments, with an outer segment having a free leading edge and inner segments which in turn become outer segments as adjoining outer segments are removed;

a feed mechanism for repeatedly moving the sheet material in advancement and retraction intervals, said advancement intervals serving to advance successive outer ones of said segments through the discharge opening and out of the housing, said retraction interval serving to initialize the sheet material for said advancement interval;

a sensor for repeatedly detecting arrival of a said leading edge of retracting sheet material at a first position defining the end of said retraction interval and the beginning of said

advancement interval, as sheet material is repeatedly retracted back into the discharge opening; and

a control device for receiving a signal from the sensor indicating a said arrival of a said leading edge at said first position, and for initiating said advancement interval from said first position, said advancement interval terminating when said leading edge of the sheet material has advanced from said first position a pre-determined amount, to repeatedly place said spaced tear lines at a second position that is variable downstream of said first position in relation to variations in the lengths of said segments, said second position defining the beginning of a said retraction interval for a next adjacent segment, when it is in turn initialized for said advancement interval.

58. A dispenser for dispensing flexible sheet material from a roll, comprising:

a chassis defining a web discharge opening and a feed mechanism for advancing the sheet material to the discharge opening;

a detection system for detecting an absence of sheet material within said feed mechanism;

a transfer mechanism for contacting a leading segment of sheet material extending from a roll and moving said sheet material into a feed nip of said feed mechanism, said transfer mechanism comprising:

a transfer member biased toward said feed nip and into contact with said leading segment of sheet material;

a transfer link movable between a first position wherein said transfer link retains said transfer bar away from said feed nip, against said bias, and a release position wherein said transfer link permits said transfer member to move toward said feed nip under said bias and into contact with said leading segment of sheet material; and

an actuator for driving said transfer link from said first position to said release position; and

control means for electrically activating said actuator to drive said transfer link from said first position to said release position in response to said detection system detecting an absence of sheet material within said feed mechanism.

59. The dispenser according to claim 58, further comprising a spring for biasing a said transfer link toward said first position.

60. The dispenser according to claim 58, wherein said transfer link is pivotally mounted for rotation between said first position and said release position.

61. The dispenser according to claim 58, wherein said activator comprises a motor.

62. The dispenser according to claim 58, further comprising a cover pivotally mounted to said chassis for movement between an open position and a closed position, and wherein said transfer link is, when said cover is in said closed position, biased toward said nip by a spring positioned between said cover and said transfer link.

63. The dispenser according to claim 62, wherein said transfer link is pivotally mounted to fall away from said feed nip under gravitational force upon said cover being moved from said closed position to said open position.

64. A dispenser for dispensing flexible sheet material, comprising:

a chassis defining a gap for passage of a sheet material roll core therethrough;

at least one finger-operable, releasable support mechanism connected to said chassis for rotatably supporting the core above said gap, said support being movable from a core retention position to a core release position for releasing said core into said gap; and

a dispenser cover movably mounted to said chassis for movement between a closed position and an open position, said cover being situated, when in said open position, to receive a said core dropped through said gap.

65. The dispenser of claim 64, wherein said support mechanism includes a finger-operable release handle extending through a wall of said chassis.

66. The dispenser of claim 65, wherein said release handle is attached to said chassis through a spring arm that is biased to place said releasable support mechanism in said core retention position.

67. The dispenser of claim 66, wherein said spring arm is attached to said chassis at one end and has attached proximate an opposite end said release handle and a mounting hub for supporting a said core.

68. The dispenser of claim 64, wherein said cover has a surface that is, in said open position of the cover, inclined for encouraging a core dropped thereon to roll into a forward portion of said cover.

69. A proximity sensor circuit, comprising:

an antenna having a baseline stray capacitance;

an oscillator circuit coupled to the antenna and generating an oscillation signal having a predetermined oscillation amplitude corresponding to the baseline stray capacitance of the antenna, the oscillation amplitude of the oscillation signal increasing in response to an increase in stray capacitance from the baseline stray capacitance of the antenna and decreasing in response to a decrease in stray capacitance from the baseline stray capacitance of the antenna; and

an automatic sensitivity control circuit coupled to the oscillator circuit and detecting a change in the oscillation amplitude of the oscillator signal, the automatic sensitivity control circuit controlling the amplitude of the oscillator signal to counteract a change in stray capacitance from the baseline stray capacitance of the antenna and maintaining the oscillation amplitude of the oscillator signal at the predetermined oscillation amplitude to provide a substantially constant sensitivity to changes in stray capacitance from the baseline stray capacitance of the antenna.

70. The proximity sensor circuit according to claim 69, wherein the oscillator circuit has a Colpitts oscillator-type topography.

71. The proximity sensor circuit according to claim 70, wherein the automatic sensitivity control circuit controls the amplitude of the oscillator signal by controlling a current in the oscillator circuit.

72. The proximity sensor circuit according to claim 69, wherein a detect signal is generated by the proximity sensor circuit when the automatic sensitivity control circuit detects an increase in the oscillation amplitude of the oscillator signal.

73. The proximity sensor circuit according to claim 72, further comprising a shield coupled to and driven by the oscillator circuit, the shield reducing the baseline stray capacitance of the antenna.

74. The proximity sensor circuit according to claim 73, wherein the shield reduces the baseline stray capacitance an amount that is about two orders of magnitude greater than an increase in stray capacitance sensed by the proximity sensor circuit for generating the detect signal.

75. The proximity sensor circuit according to claim 72, wherein the increase in oscillation amplitude is caused by a hand placed in proximity to the antenna.

76. A method for providing substantially constant sensitivity for sensing changes in a baseline stray capacitance to an antenna, the method comprising steps of:

generating an oscillation signal coupled to the antenna and having a predetermined oscillation amplitude corresponding to the baseline stray capacitance of the antenna, the oscillation amplitude of the oscillation signal increasing in response to an increase in stray capacitance from the baseline stray capacitance of the antenna and decreasing in response to a decrease in stray capacitance from the baseline stray capacitance of the antenna;

detecting a change in the oscillation amplitude of the oscillator signal;

controlling the amplitude of the oscillator signal to counteract the detected change in stray capacitance from the baseline stray capacitance of the antenna; and

maintaining the oscillation amplitude of the oscillator signal at the predetermined oscillation amplitude to provide a substantially constant sensitivity to changes in stray capacitance from the baseline stray capacitance of the antenna.

77. The method according to claim 76, wherein the step of generating the oscillation signal is performed by an oscillator circuit having a Colpitts oscillator-type topography.

78. The method according to claim 77, wherein the step of controlling the amplitude of the oscillator signal includes a step of controlling a current in the oscillator circuit.

79. The method according to claim 77, wherein the step of detecting a change in the oscillation amplitude of the oscillator signal includes a step of generating a detect signal when an increase in the oscillation amplitude is detected.

80. The method according to claim 79, wherein the oscillator circuit includes a shield, the method further comprising a step of driving a shield with a signal related to the oscillation signal for reducing the baseline stray capacitance of the antenna.

81. The method according to claim 80, wherein the shield reduces the baseline stray capacitance an amount that is about two orders of magnitude greater than an increase in stray capacitance that generates the detect signal.

82. The method according to claim 79, wherein the increase in oscillation amplitude is caused by a hand placed in proximity to the antenna.

83. A dispenser for dispensing flexible sheet material from a roll, comprising:

a support for rotatably supporting a roll of sheet material having a plurality of spaced apart tear lines defining individual segments of sheet material;`

a feed mechanism for advancing sheet material from said roll;

a motor for driving the feed mechanism;

a transfer mechanism for transferring a leading portion of a leading segment of said sheet material into said feed mechanism, such that said leading portion is folded over during said transfer to form a folded-over edge portion;

a sensor for detecting a leading edge of said sheet material;

control means for controlling application of power to said motor to drive said feed mechanism so as to carry out dispensing operations wherein predetermined lengths of sheet material are dispensed from leading edges of said sheet material detected by said first sensor, said control means further controlling operation of said transfer mechanism;

wherein, in a first dispensing operation carried out by said control device following an operation of said transfer mechanism, said control device controls said motor so as to carry out an initial dispensing operation wherein a first predetermined length of sheet material is dispensed from the point at which the leading edge is detected by said sensor, and to carry out subsequent

dispensing operations wherein a second predetermined length of sheet material larger than said first predetermined length is dispensed from the point at which subsequent leading edges are detected by said sensor, the difference between said first predetermined length and said second predetermined length corresponding approximately to a length of said folded-over portion, such that a said tear line between said first segment of sheet material and a second segment of sheet material is, following the initial dispensing operation, positioned between said feed mechanism and said first sensor, and subsequent tear lines between subsequent segments of the sheet material are positioned between said feed mechanism and said first sensor, following subsequent dispensing operations.

84. The dispenser according to claim 83, further comprising a second support for rotatably supporting a second roll of sheet material having a plurality of spaced apart tear lines defining individual segments of sheet material, and wherein said control means controls said transfer mechanism to transfer feed from said first roll to said second roll upon a detected depletion of the first roll.

85. A dispenser for dispensing flexible sheet material, comprising:

a chassis;

a support for rotatably supporting a roll of sheet material within said chassis;

a feed mechanism for advancing the sheet material;

a motor for driving the feed mechanism;

a dispenser cover movably mounted with respect to said chassis for movement between a closed position and an open position, said cover having a surface defining a dispensing slot, said surface moving into overlying registry with a discharge slot-defining portion of said chassis when said cover is moved into said closed position, such that a leading segment of sheet material extending from said discharge slot when said cover is in said open position may become lodged between said cover and said chassis when said cover is moved to said closed position;

a sensor for sensing when said cover is in said open position and when said cover is in said closed position, and outputting a signal indicative thereof;

a control device for controlling said motor to drive said feed mechanism so as to dispense a predetermined length of the sheet material in response to said sensor indicating that said cover has been moved to said closed position, said predetermined length of sheet material being sufficient to cause a said leading segment of sheet material lodged between said chassis and said cover to loop out of the dispensing slot formed in said cover.

86. The dispenser of claim 85, wherein said cover is pivotally mounted to said chassis.

87. The dispenser of claim 85, wherein said predetermined length of sheet material equals a length of material dispensed by said dispenser in subsequent dispensing operations.